RACU JUMPER RECONFIGURATION

NOTE
Verify PCS configured for both MDMs.

1. VERIFY PMA 1 AND NODE 1 A AND B HEATERS' CONFIGURATION

PCS Node 1: TCS

Node 1: TCS

'PMA 1'

√PMA1 Htr A (four) - Inh
√B (four) - Ena_Opr

'NODE 1'

√NOD1 Htr A (nine) - Inh
√B (nine) - Ena_Opr

2. INHIBIT NCS AUTORETRY

PCS Node 1: C&DH: MDM N1-2

Primary NCS MDM Node1

'Software Control'

sel MDM Utilities
sel Commands
cmd Prim_NCS_Inh_NCS_Retry **Execute**

Primary_NCS_MDM_Utilities

√Auto Retry Inhibit - X

3. COMMAND N1-1 TO DIAGNOSTIC

NOTE
1. Transition takes approximately 2 minutes.
2. Expect PCS FDA 'CDH MDM N1-2 Detected RT Fail MDM N1-1 - PMA1'.

PCS Node 1: C&DH: MDM N1-1

Secondary NCS MDM Node1

'MDM Major State'

sel Commands
cmd N1_1_MDM_Xsitn_Dgnstc_State_Arm **Execute**
cmd N1_1_MDM_Xsitn_Dgnstc_State **Execute**

Wait for PCS FDA before proceeding.

4. REMOVE N1-1 MDM POWER AT RPC
'RPCM N1RS1 A'

sel RPC 11
sel Commands
cmd Open **Execute**
√Position - Op

5. DISABLE RT DEVICES I/O ON EPS BUSES

PCS Node 1: C&DH: MDM N1-2
Primary NCS MDM Node1

sel UB EPS_N1-14
sel RT Status
sel Inhib_RT Commands

PRIM_NCS_UB_EPS_N1_14_Inhib

cmd Inhib_RPCM_N1RS1_A **Execute**
cmd Inhib_RPCM_N1RS1_B **Execute**
cmd Inhib_RPCM_N1RS1_C **Execute**

RT_Status

√RT Inhibit 18, 19, 20 (three) - X

6. POWER DOWN RACU 6

NOTE
RACU commands sent from orbiter will not work if FGB relay matrix is in **MCC-M** command state.

CRT SM 204 FGB

√COMMANDING - INH

If COMMANDING - INH

RUSSIAN GROUND	AOS	LOS
Pass 1	___/___:___:___	___/___:___:___
Pass 2	___/___:___:___	___/___:___:___

Crew inform **MCC-H**, "Ready for RACU 6 power down."
MCC-H inform **MCC-M**, "Go for RACU 6 Power OFF."
MCC-M inform **MCC-H**, "RACU 6 Powered Off at __/___:___:__ GMT."

If COMMANDING - ENA (crew commanding)
MCC-M inform **MCC-H**, "Go for RACU 6 Power OFF."
MCC-H inform crew, "Moscow GO for RACU 6 Power OFF."

On MCC GO

PCS FGB: EPS: RACU Details
RACU Details

sel Commands
cmd RACU 6 - Off **Execute**

Crew inform **MCC-H**, "RACU 6 Power OFF at __/__:__:___ GMT."

On MCC GO or when RACU 6 commanded OFF

PCS FGB: EPS: RACU Details
RACU Details

√RACU 6 Converter Off
√Input Current < 2.0
√Output Current: 0.00
√Voltage: 0.00

Notify EVA crew: "RACU 6 OFF. Go for String 1 Jumper Reconfig."

NOTE
EV removes RACU 6 jumper and installs APCU 2 jumper per EVA procedure.

7. VERIFY FGB POWER GENERATION STATUS
On EV GO

PCS FGB: EPSz
FGB: EPS

√Main Bus Voltage 1,2 (two): 28.0 --- 29.0
√Battery Voltage 1 --- 6 (six, along bottom) > 25.5

```
************************************************
*  If any Battery Voltage < 25.5 V             *
*       Notify MCC: "FGB Batteries Low.        *
*        Wait 1 rev for FGB battery charge."   *
************************************************
```

8. COMMAND RACU 6 ON

CRT SM 204 FGB

√COMMANDING - INH

If COMMANDING - INH

RUSSIAN GROUND	AOS	LOS
Pass 1	___/___:___:___	___/___:___:___
Pass 2	___/___:___:___	___/___:___:___

Crew inform **MCC-H**, "Ready for RACU 6 Power ON."
MCC-H inform **MCC-M**, "Go for RACU 6 Power ON."
MCC-M inform **MCC-H** inform crew, "RACU 6 Power ON at __/__:__:__."

If COMMANDING - ENA (crew commanding)
Crew inform **MCC-H**, "Ready for RACU 6 Power ON."
MCC-M inform **MCC-H**, "Go for RACU 6 Power ON."
MCC-H inform crew, "Moscow Go for RACU 6 Power ON."

On MCC GO

PCS FGB: EPS: RACU Details
RACU Details

sel Commands
cmd RACU 6 - On **Execute**

√RACU 6 Converter On
√Input Current > 2.0
√Output Current > 0.3
√Voltage: 121 --- 125

Crew inform **MCC-H**, “RACU 6 Power On at ___/__:__:__ GMT.”

```
*******************************************
*  If Output Current > 10 Amps            *
*       sel    Commands                   *
*       cmd RACU 6 - OFF  Execute         *
*                                         *
*     √MCC-H                              *
*******************************************
```

9. VERIFY N1-1 TRANSITION TO STANDBY

NOTE
MDM may take up to 5 minutes to warm-up and go through POST.

PCS Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node1
‘MDM Major State’

√State - Standby

10. COMMAND N1-1 MDM TO SECONDARY
‘MDM Major State’

sel Commands
cmd N1_1_MDM_Xsitn_Second_State **Execute**
√State - Secondary

11. ENABLE RT DEVICES I/O ON EPS BUSES

```
*************************************************************
*  If N1-2 power down will be delayed                       *
*       Node 1: C&DH: MDM N1-2                              *
*       ‘Software Control’                                  *
*                                                           *
*       sel    MDM Utilities                                *
*       sel    Commands                                     *
*       cmd  Prim_NCS_Ena_NCS_Retry  Execute                *
*                                                           *
*       Primary_NCS_MDM_Utilities                           *
*                                                           *
*     √Auto Retry Inhibit - blank                           *
*************************************************************
```

PCS Node 1: C&DH: MDM N1-2
Primary NCS MDM Node1

sel UB EPS N1 14
sel RT Status
sel Ena_RT Commands

Prim_NCS_UB_EPS_N1_14_Ena

cmd Ena_RPCM_N1RS1_A **Execute**
cmd Ena_RPCM_N1RS1_B **Execute**
cmd Ena_RPCM_N1RS1_C **Execute**

RT_Status

√RT Inhibited 18, 19, 20 (three) - blank

12. PROVIDE POWER TO MDM SDO CARD

PCS Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node1
'RPCM N1RS1 A'

sel RPC 5
sel Commands
cmd Close **Execute**
√Position - Cl

13. INHIBIT PMA 1 B HEATERS AND PMA HEATER RPCs

PCS Node 1: TCS
Node1: TCS
'PMA1'

sel PMA1 Htr[X]B [X] = 1 2 3 5

sel Htr Commands (right side)
cmd Inh **Execute**
√PMA1 Htr[X]B Availbty - Inh

sel RPC Commands (right side)
cmd Close Cmd - Inhibit **Execute**
√Close Cmd - Inh

Repeat

14. INHIBIT NODE 1 B HEATERS AND NODE 1 HEATER RPCs

PCS Node 1: TCS
Node1: TCS
'NODE 1'

sel Nod1 Htr[X]B [X] = | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

sel Htr Commands (right side)
cmd Inh **Execute**
√Nod1 Htr[X]B Availbty - Inh

sel RPC Commands (right side)
cmd Close Cmd - Inhibit **Execute**
√Close Cmd - Inh

Repeat

15. INHIBIT NCS AUTO RETRY

PCS Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node1
'Software Control'

sel MDM Utilities
sel Commands
cmd Second_NCS_Inh_NCS_Retry **Execute**

Secondary_NCS_MDM_Utilities

√Auto Retry Inh - X

16. COMMAND N1-2 TO DIAGNOSTICS

On MCC GO

NOTE
1. Transition takes approximately 2 minutes.
2. Expect PCS to lose connection with MDM.
3. Possible PDI DECOM fail message.

PCS Node 1: C&DH: MDM N1-2
Primary NCS MDM Node1
'MDM Major State'

sel Commands
cmd N1_2_MDM_Xsitn_Dgnstc_State_ARM **Execute**
cmd N1_2_MDM_Xsitn_Dgnstc_State **Execute**

Wait for PDI DECOM Fail message before proceeding.

17. TELEMETRY RECOVERY ON AND OIU

CRT SM 212 OIU

BUS 4 BC - ITEM 15 EXEC (*)
BUS 3 RT - ITEM 10 EXEC (*)
Change OIU N1 Phys Dev to N1-1 - ITEM 18 +4 EXEC

Wait 1 minute from diagnostic command.

NOTE
Possible PDI DECOM fail message.

CRT Reload OIU FORMAT 2 - ITEM 1 +2 EXEC

18. TELEMETRY RECOVERY ON PCS

NOTE
Expect PCS FDA 'CDH MDM N1-1 Detected RT Fail MDM N1-2 - PMA1'.

PCS On PCS attached to PDIP N1-1 port
sel arrow above 'PCS' logo
sel Start/Restart PCS CDS
sel icon to open PCS CDS Main Control Panel Window and enlarge
(may be buried behind displays)
√Status Box - yellow

sel 'Connect to MDM'

√Status Box - green
Verify 'connected to MDM' indicated

If displays not loaded
sel arrow above 'PCS' logo
sel Start PCS CDDF display

Home page will display when load complete (~1 minute).

PCS Node 1: C&DH: MDM N1-1
Primary NCS MDM Node1
'MDM Major State'

√State - Primary

```
* ************************************************ *
*  If State not Primary or no N1-1 TLM           *
*                                                *
*     √MCC-H                                     *
* ************************************************ *
```

19. REMOVE N1-2 MDM POWER AT RPC

NOTE
Expect PCS FDA (LED and message only) when MDM power removed.

PCS Node 1: EPS
NODE1:EPS

sel RPCM N1RS2 C

RPCM Details

sel RPC 13
sel Commands
cmd Open **Execute**
√Position - Op

20. DISABLE RT DEVICES I/O ON EPS BUSES

PCS Node 1: C&DH: MDM N1-1
Primary NCS MDM Node1

sel UB EPS N1 23
sel RT Status
sel Inhib_RT Commands

PRIM_NCS_UB_EPS_N1_23_Inhib

cmd Inhib_RPCM_N1RS2_A **Execute**
cmd Inhib_RPCM_N1RS2_B **Execute**
cmd Inhib_RPCM_N1RS2_C **Execute**

Prim_EPS_N1_23_RT_Status

√RT Inhibited 18, 19, 20 (three) - X

21. POWER DOWN RACU 5

NOTE
RACU commands sent from orbiter will not work if FGB relay matrix is in **MCC-M** command state.

CRT SM 204 FGB

√COMMANDING - INH

If COMMANDING - INH

RUSSIAN GROUND	AOS	LOS
Pass 1	___/___:___:___	___/___:___:___
Pass 2	___/___:___:___	___/___:___:___

Crew inform **MCC-H**, “Ready for RACU 5 power down.”
MCC-H inform **MCC-M**, “Go for RACU 5 Power OFF.”
MCC-M inform **MCC-H**, “RACU 5 Powered OFF at __/__:__:__ GMT.”

If COMMANDING - ENA (crew commanding)
MCC-M inform **MCC-H**, “Go for RACU 5 Power OFF.”
MCC-H inform crew, “Moscow Go for RACU 5 Power OFF.”

On MCC GO

PCS FGB: EPS: RACU Details
RACU Details

sel Commands
cmd RACU 5 - Off **Execute**
Crew inform **MCC-H**, “RACU 5 Power OFF at ___/__:__:__ GMT.”

On MCC GO or when RACU 5 commanded OFF

PCS FGB: EPS: RACU Details
RACU Details

√RACU 5 Converter Off
√Input Current < 2.0
√Output Current: 0.00
√Voltage: 0.00

IVA Notify EVA crew, “RACU 5 OFF. Go for string 2 jumper reconfig.”

NOTE
EV removes RACU 5 jumper and installs APCU 1 jumper per EVA procedure.

22. VERIFY FGB POWER GENERATION STATUS

On EV GO

PCS FGB: EPS

FGB:EPS

√Main Bus Voltage 1,2 (two): 28.0 --- 29.0
√Battery Voltage 1 --- 6 (six along bottom) > 25.5

****
* If any Battery Voltage < 25.5 V *
* Notify **MCC-H**: “FGB Batteries Low. *
* Wait 1 rev for FGB battery charge.” *
****

23. COMMAND RACU 5 ON

CRT SM 204 FGB

√COMMANDING - INH

If COMMANDING - INH

RUSSIAN GROUND	AOS	LOS
Pass 1	___/___:___:___	___/___:___:___
Pass 2	___/___:___:___	___/___:___:___

Crew inform **MCC-H**, “Ready for RACU 5 Power ON.”
MCC-H inform **MCC-M**, “Go for RACU 5 Power ON.”
MCC-M inform **MCC-H** inform crew, “RACU 5 Power ON at __/__:__:__ GMT.”

If COMMANDING - ENA (crew commanding)
Crew inform **MCC-H**, “Ready for RACU 5 Power ON.”
MCC-M inform **MCC-H**, “Go for RACU 5 Power ON.”
MCC-H inform crew, “Moscow Go for RACU 5 Power ON.”

On MCC GO

PCS FGB: EPS: RACU Details

RACU Details

sel Commands
Start timer at RACU 5 ON command.

00:00:00 **cmd** RACU 5 - On **Execute**

√RACU 5 Converter On
√Input Current > 2.0 A
√Output Current > 0.3 A
√Voltage: 121 --- 125 V

Crew inform **MCC-H**, "RACU 5 Power ON at ___/__:__:__."

```
*******************************************
*  If Output Current > 10 Amps            *
*      sel   Commands                     *
*      cmd RACU 5 - OFF  Execute          *
*                                         *
*    √MCC-H                               *
*******************************************
```

24. VERIFY N1-2 IN STANDBY

PCS Node 1: C&DH: MDM N1-1
Primary NCS MDM Node1
'MDM Major State'

√State - Standby

```
****************************
*  If State not Standby    *
*                          *
*    √MCC-H                *
****************************
```

25. COMMAND N1-1 TO STANDBY

NOTE
Expect PDI DECOM fail message.

PCS Node 1: C&DH: MDM N1-1
Primary NCS MDM Node1
'MDM Major State'

sel Commands
00:05:00 **cmd** Prim_NCS_Xsitn_Stby_State **Execute**

26. TELEMETRY RECOVERY ON PCS AND OIU

CRT SM 212 OIU

BUS 3 BC - ITEM 11 EXEC (*)
BUS 4 RT - ITEM 14 EXEC (*)
Change OIU N1 Phys Dev to N1-2 - ITEM 18 +3 EXEC

Wait 1 minute from command to standby.

NOTE
Expect PDI DECOM Fail message.

Reload OIU FORMAT - ITEM 1 +2 EXEC

27. TELEMETRY RECOVERY ON PCS

PCS On PCS attached to PDIP N1-2 port
sel icon to open PCS CDS Main Control Panel Window
√Status Box - yellow

sel 'Connect to MDM'
√Status Box - green
Verify 'connected to MDM' indicated.

PCS Node 1: C&DH: MDM N1-2
Primary NCS MDM Node1
'MDM Major State'

√State - Primary

28. COMMAND N1-1 MDM TO SECONDARY

PCS Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node1
'MDM Major State'

cmd N1_1_MDM_Xstin_Second_State **Execute**
√State - Secondary

29. ENABLE RT DEVICES I/O ON EPS BUSES

PCS Node 1: C&DH: MDM N1-2
Primary NCS MDM Node1

sel UB EPS_N1-23
sel RT Status
sel Ena_RT Commands

Prim_NCS_UB_EPS_N1_23_Ena

cmd Ena_RPCM_N1RS2_A **Execute**
cmd Ena_RPCM_N1RS2_B **Execute**
cmd Ena_RPCM_N1RS2_C **Execute**

Prim_EPS_N1_23_RT_Status

√RT Inhibited 18, 19, 20 (three) - blank

30. ENABLE NCS AUTO RETRY

Node 1: C&DH: MDM N1-1

Secondary NCS MDM Node1

'Software Control'

sel MDM Utilities
sel Commands
cmd Sec_NCS_Ena_NCS_Retry **Execute**

MDM Utilities

√Auto Retry Inh - blank

31. PROVIDE POWER TO MDM SDO CARD

Primary NCS MDM Node1

'RPCM N1RS2 C'

sel RPC 3
sel Commands
cmd Close **Execute**
√Position - Cl

32. REACTIVATE EARLY COMM HEATERS

NOTE

The Early Comm equipment is powered by the Stbd CBM RPCs.

PCS Node 1: EPS: RPCM N1RS1 C

RPCM N1RS1 C

sel RPC [X] [X] = 6 13

sel Commands
cmd Close **Execute**
√Position - Cl

Repeat

PCS Node 1: EPS: RPCM N1RS2 A

RPCM N1RS2 A

sel RPC 5
sel Commands
cmd Close **Execute**
√Position - Cl

NOTE

The PMA 1 and Node 1 Heater set points will be commanded by **MCC-H**.